Agency for Healthcare Research and Quality
Advancing Excellence in Health Care

NATIONAL GUIDELINE CLEARINGHOUSE

General

Guideline Title

Pneumococcal vaccination in adult and pediatric patients undergoing cancer treatment.

Bibliographic Source(s)

Alberta Provincial Tumour Council, Alberta Health Services Province-wide Immunization Program Standards and Quality. Pneumococcal vaccination in adult and pediatric patients undergoing cancer treatment. Edmonton (Alberta): CancerControl Alberta; 2012 Nov. 16 p. (Clinical practice guideline; no. SUPP-005). [53 references]

Guideline Status

This is the current release of the guideline.

Recommendations

Major Recommendations

The following recommendations have been adapted from existing practice guidelines and consensus statements, including those from the Alberta Health Services (AHS) Province-wide Immunization Program.

1. Immunization against *Streptococcus pneumoniae* using pneumococcal vaccine(s) is very important for patients who may be immunosuppressed as a result of their malignancy or treatment of their malignancy. This includes patients with solid tumours, leukemia, lymphoma, multiple myeloma, Hodgkin disease, those receiving hematopoietic stem cell (HSCT) or blood and marrow transplants (BMT), and those receiving chemotherapy.
2. Adult and pediatric patients who as a result of their malignancy or treatment of their malignancy may be immunosuppressed should consult with Public/Community Health regarding an immunization schedule for receipt of pneumococcal vaccines.
3. Adult and pediatric patients undergoing BMT should consult with Public/Community Health regarding an immunization schedule for receipt of pneumococcal vaccine(s) starting at six months post-transplant. When the recipient is at high risk of chronic graft-versus-host disease (GVHD), vaccine response may be improved by donor vaccination.
4. Vaccine types:
    a. Pneumococcal conjugate vaccine (PCV-13): evidence from healthy children under 2 years who have been vaccinated indicates that serotype-specific efficacy is between 94% and 97%.
    b. Pneumococcal polysaccharide vaccine (PNEUMO-P, Pneumovax® 23): the overall effectiveness of PNEUMO-P at preventing pneumococcal bacteremia is between 50% and 70% in healthy individuals. Of note, it is less effective than the conjugate vaccine in protecting immunosuppressed patients. In particular, it has been substantially less effective in patients with multiple myeloma, Hodgkin disease, and non-Hodgkin lymphoma, especially during active treatment.

5. Timing:
    a. Pneumococcal immunization should be given four to six weeks (and at least 14 days) before the start of chemotherapy.
    b. Immunization during chemotherapy or radiation therapy should be avoided because antibody responses are suboptimal. If this is not possible, and delay of treatment would result in an increased risk of cancer-related complications or death, it is recommended that, for those patients who would likely benefit from the vaccine, immunization be delayed for three months after completing immunosuppressive chemotherapy.
    c. Patients immunized while on immunosuppressive therapy or within the two weeks before starting therapy should be considered unimmunized and should be reimmunized at least three months after discontinuation of therapy. Further discussion with Alberta Health Services - Public Health may be appropriate before the patient is reimmunized.
    d. Pneumococcal polysaccharide immunization, unlike influenza vaccination, is given as a once-only vaccine; however, re-immunization is recommended in certain populations once in three to five years depending on when the patient was initially immunized with PNEUMO-P. Refer patient to Public/Community Health for further assessment.
    e. When PCV-13 is also indicated, the conjugate vaccine series/dose should be completed prior to administering PNEUMO-P.
6. Pneumococcal vaccine is contraindicated in the following people:
    a. Anyone who has had an anaphylactic reaction to a previous dose of the vaccine.
    b. Anyone who has an anaphylactic reaction or other allergic reaction to any component of the vaccine.
    c. Defer immunization in anyone who presents with a serious acute febrile illness; recommendations should be provided for these individuals to be immunized when their symptoms have resolved. Individuals with non-serious febrile illness may be immunized.

   Although there is no evidence that PNEUMO-P is harmful to either a pregnant woman or to her fetus, it is not recommended during pregnancy. Pregnant women who have chronic illnesses should consult their provider before being immunized. Women who have underlying conditions known to put them at risk of pneumococcal disease should be immunized before pregnancy, if possible.

Clinical Algorithm(s)

None provided

Scope

Disease/Condition(s)

- Cancer
- *Streptococcus pneumoniae* infection (pneumonia and pneumonia complications)

Guideline Category

Management

Prevention

Clinical Specialty

Family Practice

Infectious Diseases

Internal Medicine

Oncology

Pediatrics

Preventive Medicine

Intended Users

Advanced Practice Nurses

Nurses

Physician Assistants

Physicians

Public Health Departments

Guideline Objective(s)

To describe the use (i.e., type of vaccine, timing of vaccination, etc.) of the pneumococcal vaccine in patients with cancer

Target Population

Children and adults with solid tumours or hematologic malignancies

Interventions and Practices Considered

1. Immunization against *Streptococcus pneumoniae* using pneumococcal vaccine(s)
    - Pneumococcal conjugate vaccine (PCV-13)
    - Pneumococcal polysaccharide vaccine (PNEUMO-P, Pneumovax® 23)
2. Timing of immunization
3. Consideration of vaccine contraindications

Major Outcomes Considered

- Efficacy of vaccines
- Immune response
- Mortality

Methodology

Methods Used to Collect/Select the Evidence

Searches of Electronic Databases

Description of Methods Used to Collect/Select the Evidence

Research Questions

Specific research questions to be addressed by the guideline document were formulated by the guideline lead(s) and Knowledge Management (KM) Specialist using the PICO question format (patient or population, intervention, comparisons, outcomes).

Guideline Questions

- What is the current evidence for response to the pneumococcal vaccine among adult and pediatric oncology patients receiving chemotherapy or other systemic therapy?
- What is the best timing for administering the pneumococcal vaccine in relation to the therapy cycle?

Search Strategy

The PubMed (1965 through August 2012) database was searched for practice guidelines, systematic reviews, meta-analyses, randomized controlled trials, and clinical trials. The National Guideline Clearinghouse was also searched for relevant guidelines, in addition to individual guideline developers' websites: World Health Organization, Health Canada, the Public Health Agency of Canada, the National Comprehensive Cancer Network, the American Academy of Pediatrics, the Centers for Disease Control and Prevention, and the Département D'Oncologie Pédiatrique (France). The search terms included *pneumococcal vaccine* and *neoplasm*.

Number of Source Documents

Not stated

Methods Used to Assess the Quality and Strength of the Evidence

Not stated

Rating Scheme for the Strength of the Evidence

Not applicable

Methods Used to Analyze the Evidence

Systematic Review with Evidence Tables

Description of the Methods Used to Analyze the Evidence

Evidence was selected and reviewed by the working group and the Guideline Utilization Resource Unit (GURU). A detailed description of the methodology followed during the guideline development process can be found in the Guideline Utilization Resource Unit Handbook (see the "Availability of Companion Documents" field).

Evidence Tables

Evidence tables containing the first author, year of publication, patient group/stage of disease, methodology, and main outcomes of interest are assembled using the studies identified in the literature search. Existing guidelines on the topic are assessed by the Knowledge Management (KM) Specialist using portions of the Appraisal of Guidelines Research and Evaluation (AGREE) II instrument (http://www.agreetrust.org) and those meeting the minimum requirements are included in the evidence document. Due to limited resources, GURU does not regularly employ the use of multiple reviewers to rank the level of evidence; rather, the methodology portion of the evidence table contains the pertinent information required for the reader to judge for himself the quality of the studies.

Methods Used to Formulate the Recommendations

Expert Consensus

Description of Methods Used to Formulate the Recommendations

Formulating Recommendations

The working group members formulated the guideline recommendations based on the evidence synthesized by the Knowledge Management (KM) Specialist during the planning process, blended with expert clinical interpretation of the evidence. As detailed in the Guideline Utilization Resource Unit Handbook (see the "Availability of Companion Documents" field), the working group members may decide to adopt the recommendations of another institution without any revisions, adapt the recommendations of another institution or institutions to better

reflect local practices, or develop their own set of recommendations by adapting some, but not all, recommendations from different guidelines.

The degree to which a recommendation is based on expert opinion of the working group and/or the Provincial Tumour Team members is explicitly stated in the guideline recommendations. Similar to the American Society of Clinical Oncology (ASCO) methodology for formulating guideline recommendations, the Guideline Utilization Resource Unit (GURU) does not use formal rating schemes for describing the strength of the recommendations, but rather describes, in conventional and explicit language, the type and quality of the research and existing guidelines that were taken into consideration when formulating the recommendations.

The recommendations in the current guideline have been adapted from existing practice guidelines and consensus statements, including those from the Alberta Health Services (AHS) *Province-wide Immunization Program*. Evidence from clinical trials, retrospective reviews, and case studies was also reviewed and considered.

Rating Scheme for the Strength of the Recommendations

Not applicable

Cost Analysis

A formal cost analysis was not performed and published cost analyses were not reviewed.

Method of Guideline Validation

Internal Peer Review

Description of Method of Guideline Validation

This guideline was reviewed and endorsed by a working group consisting of members the Alberta Provincial Tumour Council.

When the draft guideline document has been completed, revised, and reviewed by the Knowledge Management (KM) Specialist and the working group members, it is sent to all members of the Provincial Tumour Team for review and comment. This step ensures that those intended to use the guideline have the opportunity to review the document and identify potential difficulties for implementation before the guideline is finalized. Depending on the size of the document, and the number of people it is sent to for review, a deadline of one to two weeks will usually be given to submit any feedback. Ideally, this review will occur prior to the annual Provincial Tumour Team meeting, and a discussion of the proposed edits will take place at the meeting. The working group members will then make final revisions to the document based on the received feedback, as appropriate. Once the guideline is finalized, it will be officially endorsed by the Provincial Tumour Team Lead and the Executive Director of Provincial Tumour Programs.

Evidence Supporting the Recommendations

Type of Evidence Supporting the Recommendations

The have been adapted from existing practice guidelines and consensus statements, including those from the Alberta Health Services (AHS) Province-wide Immunization Program.

Benefits/Harms of Implementing the Guideline Recommendations

Potential Benefits

Appropriate use of pneumococcal vaccination in adult and pediatric patients undergoing cancer treatment

Potential Harms

Not stated

Contraindications

Contraindications

- Pneumococcal vaccine is contraindicated in the following people:
    a. Anyone who has had an anaphylactic reaction to a previous dose of the vaccine.
    b. Anyone who has an anaphylactic reaction or other allergic reaction to any component of the vaccine.
    c. Defer immunization in anyone who presents with a serious acute febrile illness; recommendations should be provided for these individuals to be immunized when their symptoms have resolved. Individuals with non-serious febrile illness may be immunized.

  Although there is no evidence that pneumococcal polysaccharide vaccine is harmful to either a pregnant woman or to her fetus, it is not recommended during pregnancy. Pregnant women who have chronic illnesses should consult their provider before being immunized.
- Refer to Table 1 in the original guideline document for contraindications reported in existing guidelines.

Qualifying Statements

Qualifying Statements

The recommendations contained in this guideline are a consensus of members of the Alberta Provincial Tumour Council and members of the Alberta Health Services Province-wide Immunization Program Standards and Quality and represent a synthesis of currently accepted approaches to management, derived from a rapid review of relevant scientific literature. Clinicians applying these guidelines should, in consultation with the patient, use independent medical judgment in the context of individual clinical circumstances to direct care.

Implementation of the Guideline

Description of Implementation Strategy

- Present the guideline at the local and provincial tumour team meetings and weekly rounds.
- Post the guideline on the Alberta Health Services Web site.
- Send an electronic notification of the new guideline to all members of CancerControl Alberta.

Institute of Medicine (IOM) National Healthcare Quality Report Categories

IOM Care Need

Living with Illness

Staying Healthy

IOM Domain

Effectiveness

Identifying Information and Availability

Bibliographic Source(s)

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Adaptation

The recommendations have been adapted from existing practice guidelines and consensus statements, including those from the Alberta Health Services (AHS) *Province-wide Immunization Program*.

Date Released

2012 Nov

Guideline Developer(s)

CancerControl Alberta - State/Local Government Agency [Non-U.S.]

Source(s) of Funding

CancerControl Alberta

Guideline Committee

Alberta Provincial Tumour Council and the Communicable Disease Control Unit, Immunization Program Standards and Quality

Composition of Group That Authored the Guideline

The working group included medical oncologists, as well as content experts from the Communicable Disease Control Unit, Immunization Program Standards and Quality, Alberta Health Services.

Financial Disclosures/Conflicts of Interest

Participation of members of the Alberta Provincial Tumour Council and the Communicable Disease Control Unit, Immunization Program Standards and Quality, in the development of this guideline has been voluntary and the authors have not been remunerated for their contributions. There was no direct industry involvement in the development or dissemination of this guideline. CancerControl Alberta recognizes that although industry support of research, education and other areas is necessary in order to advance patient care, such support may lead to potential conflicts of interest. Some members of the Alberta Provincial Tumour Council are involved in research funded by industry or have other such potential conflicts of interest. However the developers of this guideline are satisfied it was developed in an unbiased manner.

Guideline Status

This is the current release of the guideline.

Guideline Availability

Electronic copies: Available from the Alberta Health Services Web site .

Availability of Companion Documents

The following is available:

- Guideline utilization resource unit handbook. Edmonton (Alberta): CancerControl Alberta; 2013 Jan. 5 p. Electronic copies: Available from the Alberta Health Services Web site .

Patient Resources

None available

NGC Status

This NGC summary was completed by ECRI Institute on August 12, 2014. The information was verified by the guideline developer on September 25, 2014.

Copyright Statement

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